

Claims

- [c1] 1. A vehicle comprising:
a body having a bumper mounting portion thereon;
a bumper beam mounted to the vehicle bumper mounting portion;
a fascia mounted to the vehicle in overlying fashion to the bumper beam;
and
an energy absorber integrally formed with the fascia and disposed between the fascia and the bumper beam;
whereby the fascia and energy absorber can be manufactured, assembled, installed and replaced as a unit.
- [c2] 2. The vehicle of claim 1 wherein the fascia has a thickness generally less than 3 millimeters.
- [c3] 3. The vehicle of claim 1 wherein the fascia comprises at least two layers of different materials.
- [c4] 4. The vehicle of claim 3 wherein one of the at least two layers comprises an outer layer comprising a transparent top coat material.
- [c5] 5. The vehicle of claim 4 wherein the transparent top coat has a Class A finished surface thereon.
- [c6] 6. The vehicle of claim 4 wherein the other of the at least two layers comprises an inner layer colored to have an appearance consistent with the color of the vehicle.
- [c7] 7. The vehicle of claim 6 wherein the at least two layers further comprise a structural layer, wherein the inner layer is interposed between the outer layer and the structural layer.
- [c8] 8. The vehicle of claim 7 wherein the structural layer is made of a relatively inexpensive material compared to the cost of the outer and inner layers.
- [c9] 9. The vehicle of claim 7 wherein the outer and inner layers are relatively thin compared to the thickness of the structural layer.

- [c10] 10. The vehicle of claim 7 wherein the structural layer has a thickness of about 1.5 to 2.0 millimeters.
- [c11] 11. The vehicle of claim 7 wherein the structural layer is formed from recycled materials.
- [c12] 12. The vehicle of claim 1 wherein the energy absorber is formed from beads of expanded polypropylene.
- [c13] 13. The vehicle of claim 1 wherein the energy absorber and the fascia can be shipped as a unit due to the integral formation of the energy absorber and the fascia.
- [c14] 14. A bumper comprising:
a bumper beam for mounting to a vehicle;
a fascia for mounting to the vehicle in overlying fashion to the bumper beam; and
an energy absorber integrally formed with the fascia and disposed between the fascia and the bumper beam;
whereby the fascia and energy absorber can be manufactured, assembled, installed and replaced as a unit.
- [c15] 15. The bumper of claim 14 wherein the fascia has a thickness generally less than 3 millimeters.
- [c16] 16. The bumper of claim 14 wherein the fascia comprises at least two layers of different materials.
- [c17] 17. The bumper of claim 16 wherein one of the at least two layers comprises an outer layer comprising a transparent top coat material.
- [c18] 18. The bumper of claim 17 wherein the transparent top coat has a Class A finished surface thereon.
- [c19] 19. The bumper of claim 17 wherein the other of the at least two layers comprises an inner layer colored to have an appearance consistent with the

color of the vehicle.

[c20] 20. The bumper of claim 19 wherein the at least two layers further comprise a structural layer, wherein the inner layer is interposed between the outer layer and the structural layer.

[c21] 21. The bumper of claim 20 wherein the structural layer is made of a relatively inexpensive material compared to the cost of the outer and inner layers.

[c22] 22. The bumper of claim 20 wherein the outer and inner layers are relatively thin compared to the thickness of the structural layer.

[c23] 23. The bumper of claim 20 wherein the structural layer has a thickness of about 1.5 to 2.0 millimeters.

[c24] 24. The bumper of claim 20 wherein the structural layer is formed from recycled materials.

[c25] 25. The bumper of claim 14 wherein the energy absorber is formed from beads of expanded polypropylene.

[c26] 26. The bumper of claim 14 wherein the energy absorber and the fascia can be shipped as a unit due to the integral formation of the energy absorber and the fascia.

[c27] 27. A fascia assembly for a vehicular bumper comprising:
a fascia having an inner surface and an outer surface, the outer surface having an aesthetic appearance consistent with the styling of a preselected vehicle; and
an energy absorber formed integrally with the inner surface of the fascia.

[c28] 28. The fascia assembly of claim 27 wherein the fascia has a thickness generally less than 3 millimeters.

[c29] 29. The fascia assembly of claim 27 wherein the fascia comprises at least two layers of different materials.

- [c30] 30. The fascia assembly of claim 29 wherein one of the at least two layers comprises an outer layer comprising a transparent top coat material.
- [c31] 31. The fascia assembly of claim 30 wherein the transparent top coat has a Class A finished surface thereon.
- [c32] 32. The fascia assembly of claim 30 wherein the other of the at least two layers comprises an inner layer colored to have an appearance consistent with the color of the preselected vehicle.
- [c33] 33. The fascia assembly of claim 32 wherein the at least two layers further comprise a structural layer, wherein the inner layer is interposed between the outer layer and the structural layer.
- [c34] 34. The fascia assembly of claim 33 wherein the structural layer is made of a relatively inexpensive material compared to the cost of the outer and inner layers.
- [c35] 35. The fascia assembly of claim 33 wherein the outer and inner layers are relatively thin compared to the thickness of the structural layer.
- [c36] 36. The fascia assembly of claim 33 wherein the structural layer has a thickness of about 1.5 to 2.0 millimeters.
- [c37] 37. The fascia assembly of claim 33 wherein the structural layer is formed from recycled materials.
- [c38] 38. The fascia assembly of claim 27 wherein the energy absorber is formed from beads of expanded polypropylene.
- [c39] 39. The fascia assembly of claim 27 wherein the energy absorber and the fascia can be shipped as a unit due to the integral formation of the energy absorber and the fascia.
- [c40] 40. A method of making a fascia assembly for a vehicular bumper in a mold, the fascia assembly comprising a fascia made of a thermoplastic laminate material and an energy absorber, the mold comprising a first mold half

having an inner surface defining a cavity and a second mold half defining a core that is moveable into the cavity, the core having an outer surface facing the cavity, wherein the mold halves are selectively moveable with respect to one another between a retracted position whereby the mold halves have a space defined between the two, and a forming position wherein the mold halves contact and the mold core is disposed within the cavity, the method comprising the steps of:

positioning the thermoplastic laminate material between the mold halves when the mold halves are in the retracted position;

clamping the thermoplastic laminate material between the mold halves by moving the mold halves to the forming position;

drawing the thermoplastic laminate material against the inner surface of the lower mold half to form the fascia for the vehicular bumper; and

injecting a foam material into the cavity to form an energy absorber that is integral with the fascia.

- [c41] 41. The method of claim 40 wherein the step of drawing the thermoplastic laminate material against the inner surface of the lower mold half comprises forming a vacuum between the thermoplastic laminate material and the inner surface of the lower mold half.
- [c42] 42. The method of claim 41 wherein the step of drawing the thermoplastic laminate material against the inner surface of the lower mold half further comprises forming a vacuum between the thermoplastic laminate material and the mold core.
- [c43] 43. The method of claim 42 wherein the step of drawing the thermoplastic laminate material against the inner surface of the lower mold half further comprises introducing pressurized air between the mold core and the thermoplastic laminate material after the drawing of a vacuum therebetween.
- [c44] 44. The method of claim 43 wherein the step of injecting foam material into the cavity comprises injecting foam beads into the cavity.

- [c45] 45. The method of claim 44 and further comprising the step of melting the foam beads by injecting steam into the cavity.
- [c46] 46. The method of claim 45 and further comprising the step of compressing the foam beads after they are melted.
- [c47] 47. The method of claim 46 wherein the compressing of the foam beads comprises moving the mold core toward the cavity.